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OUR QUARTER CENTENARY.

How swift the flight of time appears—
As t'were but yesterday
The fourth part of an hundred years
Has winged its course away!

Through all these years our folded page
Has monthly shown its face;
So many moons of science sage
Succeeding in the race!

The story that we had to tell
Of bee and butterfly,
Our story—have we told it well,
With love and earnestly?

O, with the lapse of years, how small
Do all our quarrels seem!
Like children's play, or like the fall
Of shadows on a stream!

This story of the spider's nest,
Of beetles, black or gray,
Is but a story, at the best,
Told by ephemera!

Still is it the *pursuit* of truth
Where all the pleasure lies,
A perfect knowledge—*that*, in sooth
Is hidden from our eyes.

Upon this quest our little barque
Has bravely held its way,
On board a crew of men of mark
As e'er sailed for Cathay;

And all our volumes, as they lie,
Came ever opportune,
Thanks to the patient industry
Of Saunders and Bethune!

January, 1894

A. R. GROTE.

1894.

With the December number, the CANADIAN ENTOMOLOGIST completed its twenty-fifth volume. The Council of the Entomological Society of Ontario have endeavored to make it as useful as possible to the working entomologists of North America. The publications of our Society consist chiefly of the ANNUAL REPORT published by the Hon. Minister of Agriculture and Arts of Ontario, in his annual report to the Legislature, and the monthly magazine, the CANADIAN ENTOMOLOGIST. The former of these is devoted particularly to papers of economic interest, and is distributed not only to our own members, but to every member of the Fruit Growers' Association of Ontario, to members of Parliament, the Mechanics' Institutes, etc., making an issue of about 6,000 copies. The CANADIAN ENTOMOLOGIST is published periodically, so as to give an opportunity to authors to describe new species and to record observations of scientific interest. In starting a new volume, the Editor and Council desire to thank their many eminent and sympathetic contributors for their valuable assistance in the past, and trust that by careful attention to their wishes and prompt publication of their articles they will be able not only to keep up the standard of excellence and popularity to which the magazine has attained, but to show every entomologist on the continent that the CANADIAN ENTOMOLOGIST is indispensable, if he wishes to keep in touch with what is going on in connection with his studies. The Council presents herewith, as a frontispiece to the new volume, a likeness of the Rev. C. J. S. Bethune, who for so many years and so acceptably has edited this magazine. They feel sure that contributors and readers who have not had the pleasure of meeting Dr. Bethune will be as much pleased to receive his likeness as a New Year's card from the Council, as we know those will be who have made his personal acquaintance and experienced his genial courtesy as editor.

W. H. HARRINGTON,
President of the Entomological Society of Ontario.

DESCRIPTION OF THE PREPARATORY STAGES OF PHY-
CIODES CARLOTA, REAKIRT (CHARIDRYAS
ISMERIA, SCUDDER).

BY WM. H. EDWARDS, COALBURGH, WEST VA.

EGG.—Pear-shaped, broad at base and rounded, tapering rapidly to a small, slightly depressed, truncated summit; marked by about twenty-four low, vertical, not sharply defined ribs, which extend a little more than half way from the top to base, but vary in individuals; below the ribs to base thickly covered with shallow and irregular (both as to size and shape) indentations, not separated by definite ridges or threads; colour, when laid, pale green. Duration of this stage, nine days.

YOUNG LARVA.—Length, at one day from the egg, .08 m.; cylindrical, even, each segment rounded, with black hairs or processes rising from concolored minute tubercles, arranged as in *Tharos* and *Nycteis*; colour green with a tint of brown; head scarcely broader than 2; obovoid, bilobed, black-brown, with many short and curved black hairs over the face. Duration of this stage, between two and three days.

After first moult: length, at one day, .12 inch; each segment rounded; colour variable, either dark-brown altogether, or light yellow-brown with a darker sub-dorsal stripe; under side, feet and legs, yellow-brown; armed with spines as in the genus, these being small, conical, shining black, with black bristles about the sides, and one larger at the top; head nearly as before. Duration of this stage, three days.

After second moult: length, at one day, .18 to .20 inch; shape as before, the spines somewhat longer in proportion; colour variable, some being wholly yellow-brown, some light-brown (not so yellow), and both these types sometimes have a dark-brown sub-dorsal stripe; some are all dull green, and some are pale black, a little mottled with gray; the spines are black and rise from small shining black tubercles; head as before. To next stage, from two to three days.

After third moult: length, at one day, .3 inch; same shape; the lower lateral spines brown-yellow, the upper rows black, and in shape as before; colour variable, some being light yellow-brown, with a dark sub-dorsal stripe, some brown-black, with a patch of red-fulvous on dorsum of 2; others have a mid-dorsal row of such patches, one to each segment; others are reddish-brown; in all the lower half of the side is different from the upper part, being either greenish-brown, mottled more or less with whitish, or light brown and so mottled, but without green; head as before.

About two-thirds of the larvæ in July, and all in August and September, went into lethargy immediately after third moult, shrinking to the length of .24 and even to .2-inch, and becoming wider in the middle; the rows of spines were brought close together, with no visible interspaces. But a few of the larvæ in July went on to fourth moult and pupation. With these the duration of the stage was about three days.

After fourth moult: length, .5 inch; of three larvæ, all were black, with red-fulvous dorsal band. Probably in a large number the colours would be quite as variable as after third moult.

MATURE LARVA.—Length, .8 inch. Colour (of three examples under view), deep black, specked with white or yellow-white; a red-fulvous mid-dorsal band from 2 to 13, sometimes widening on 2, interrupted by the tubercles after 4; along the lower half of side the black ground is much mottled with white, so as to have the effect of a white band, and on either edge is a macular white line, most complete on the upper; the spines, as in the genus, rising from shining black tubercles, and are concolored with them, tapering to a blunt point, out of which springs a straight short bristle, and there are many such about the sides from top to base; under side gray-brown; the feet black, pro-legs gray-brown; head obovoid, bilobed, shining black, with many short curved-down black hairs from black tubercles. From fourth moult to pupation about six days.

CHRYsalis.—Length, .54 inch; shape of *Tharos*, and resembling that species at all points; head case narrow, excavated at the sides, nearly square at top, a very little depressed; mesonotum rather prominent, not carinated, the summit rounded, the sides a little incurved; followed by a shallow depression; the abdominal segments somewhat raised anteriorly and compressed into a low and narrow transverse ridge, which reaches from one sub-dorsal tubercle to its fellow, but on 6 and 7 extends one tubercle farther; in all, the five upper rows of tubercles of the larva are here reproduced, low, conical, buff; general colour white, with pale black markings, specks, and abbreviated lines, so that the effect is gray, or pepper and salt, over the entire dorsal area and the abdomen; but the wing cases have a tint of brown; across these last an extra discal, sinuous row of seven clear white dots; the antennal cases blackish, with many dull white cross bars. Duration of this stage, eight days.

Considering what a common species *CARLOTA* is over at least one-third of the territory of the United States, it is remarkable that so little has been published respecting it. M. Scudder, Butt. N. E., p. 1811, says:

"This butterfly (*Ismeria*) is found over a wide extent of territory, being known south of lat. 40° from the Atlantic to the Rocky Mountains, and at the higher levels of the west, even into the heart of Colorado, and as far north as Montana, and, according to Geddes, at Brandon, Manitoba. Little is known of its history, or how many broods there are, or how it passes the winter . . . It awaits a biographer." French, Butt., p. 175, gives as its habitat, "Southern and Western States, Rocky Mountains, Montana to Arizona, occasionally in West Virginia." Mr. T. L. Mead, Wheeler Report, 1875, p. 763, says: "Not uncommon at the lower levels and at Denver. Females much worn were taken early in June, so it is probable that the species appears about the first of May, though somewhat later in the mountains."

Mr. Bruce writes:—" *Carlota* is common in every part of Colorado that I have visited, and in the eastern part of the State is particularly abundant up to about 8,000 feet altitude. At and near Denver it flies early in May and again in midsummer. There are also a few individuals in September, a partial brood. In July, it may be seen near the foothills and in neglected clearings on flowers, the many species of *Erigeron* being the favourites. The disks of these flowers will be hidden by the many *Carlota* and with them *P. Camillus*. It collects in immense swarms in certain damp places, such as where a stream has overflowed and left the ground in that condition. Larvæ of all sizes can be found almost all summer in great numbers upon the leaves of the food-plants. I have sometimes seen hundreds of them running along the railway track in search of food, having eaten every leaf from the patch of sunflowers where the eggs had been deposited, at the edge of the prairies and along the various canons and gulches." But Mr. H. W. Nash, at Pueblo, writes me he has rarely seen this species there.

I have never seen this butterfly on the wing but once, and that was at Coalburgh, May 3, 1878, when a fresh male was taken near my house. On 17th July, 1867, another was taken here by a visitor. Mr. A. D. Hopkins, of the West Virginia Agricultural Station, at Morgantown, writes me that on July 8th, 1890, he found *Carlota* abundant in Upshur Co., on the summit of Stone Coal Mountain, flying in the road and in damp places on the road.

The single mention in books of any of the early stages is by Mr. Dyar, CAN. ENT., XXV., p. 93, 1893, who briefly describes an adult larva found

by him in Colorado, apparently after it had changed colour for pupation ; he also describes the pupa from it, but unfortunately gives no feature whatever by which a pupa could be identified or determined.

Mr. Scudder assumes that *Ismeria*, B. & L., is the same species as *Carlota*, and gives that name priority. No one would ever know it from either the description or Boisduval's plate (A. D. 1833). In Butt. N. E., the description of larva and chrysalis is translated thus: Adult larva "yellow, with blackish spines and three longitudinal stripes (of blackish) ; the thoracic legs and ventral surface black, the other legs yellow." The chrysalis: "ashen gray, with some paler light spots and little dorsal tubercles nearly white." This description of the larva has no application to *Carlota*, and that of the chrysalis is too indefinite for identification. The figures of both are wholly out of drawing, and of the insects so barred and striped and spotted as to be unrecognizable. I had a copy of the book; and Mr. Reakirt had access to one, but to neither of us did it occur that *Ismeria* was what was called *Carlota*. It appears that Mr. Scudder, some years after the date of Reakirt's name, saw certain unpublished drawings by Abbot, in the British Museum, among which was *Ismeria*. Boisduval credits Abbot. Now, many of Abbot's figures, especially of larvæ and pupæ, are bad as can be, and where Boisduval has copied them. there is no improvement on the original. Whether it is a true copy or not, Boisduval's figures of *Ismeria* do not represent *Carlota*, and by comparing the description with the figures it is plain that it has been drawn from the plate and not from nature. It fits no American butterfly. Consequently, the name *Ismeria* has been rejected by every American lepidopterist, so far as I know, except Mr. Scudder, and the species is known as *Carlota*. It is right that any species so figured and described should have no standing.

It will be seen that the egg of *Carlota* is closely like that of *Tharos*, built on the same plan, same shape, same ribs, though they are more numerous, (about twenty-four in *Carlota* to about fifteen in *Tharos*), same thimble-like depressions below the ribs. It differs somewhat from the egg of *Nycteis*, which is taller in proportion to its breadth, and which shows the depressions for a space below the ribs, while the lower part is smooth. The young larvæ of all three species are alike in shape and armature. The adult *Carlota* is more like *Nycteis* in one respect, namely, that its pines are larger in proportion than those of *Tharos*. I discern no other

difference. In the chrysalis *Carlota* is like *Tharos*, and differs much from *Nycteis*, which is built on the plan of *Phaeton* and the true *Melitæas*. In habits, all three are essentially alike. I should put *Thraos* and *Batesii*, with *Camillus*, *Picta*, and other western species in one group. *Carlota* in the next, and *Nycteis* in the third, of the genus *Phyciodes*.

I first received larvæ of *Carlota* on the 15th of July, 1893, from Mr. Charles A. Wiley, of Miles City, Montana, about a dozen, past second and third moults, found on sunflower. On 24th, one larva pupated, on 28th another, and a third adult was put in alcohol. The rest of this lot went into hibernation immediately after third moult, gathering in clusters on a leaf, on a slight bed of spun silk.

On 10th August, I received another invoice of larvæ in younger stages from Mr. Wiley, after first and second moults. All these hibernated after third moult.

On Sept. 8th, came a cluster of about seventy-five eggs, from Mr. Gillette, at Fort Collins, Colorado, laid by a female confined on leaf of *Iva Xanthifolia*, 2nd Sept. Mr. Gillette informed me that at the same date full-grown larvæ were abundant on same plant and also *Helianthus annuus*. These eggs were laid three deep, the bottom layer in rows of nine eggs each, standing on their bases and close together; the next layer consisted of about a dozen, laid mostly on their sides, and the third layer of three or four only. These eggs hatched, Sept. 11th, or after nine days. Mrs. Peart compared these eggs with eggs of *Synchlœ Lacinia*, which we had at the same time, and wrote me: "There is very little difference between the two, about the same number of ribs (24), which reach a little more than half way the length of sides, not so much as two-thirds, but variable as to length; the indentations below the ribs shallow and irregular, the meshes between the indentations not sharply defined; the same is true of the ribs also; the tops of both are very little depressed, but *Carlota* is of lesser diameter." These larvæ went on to third moult, passing each moult the same day. I noticed the habit they had when alarmed of swaying the anterior half (or more) of the body from side to side, all moving together, and just as may be seen in larvæ of *Melitæa Phaeton* and other species of that genus. Almost at once after passing the third moult, 20th September, they gathered in clusters on the side of the box or on the leaves, shrunk up

and slept. This is like the behaviour of *Nycteis*, as related by me in CAN. ENT., XI., 102, 1879, only that *Nycteis* hibernated after second moult, instead of third. In *Nycteis* (p. 104, l. c.), of 92 larvæ of the June brood, 32 or about one-third hibernated, while the rest went on to pupation. Of 11 *Carlota*, from Montana, of July brood (probably the first brood), about two-thirds hibernated; of the August brood (probably the second), all hibernated. The larvæ from Colorado, of September (the last brood of the year), all hibernated. As fresh examples were taken at Coalburgh 3rd May and 17th July, there is evidence of two broods at least.

I gave these larvæ leaves of *Actinomeris squarosa*, the food of *Nycteis*, and of the Aster, the food of *Tharos*, but they refused both and fed only on sunflower.

NOTE ON COPIDRYAS PLATENSIS.

BY A. R. GROTE, A. M.

I have suggested in "Papilio" that this South American species belongs to *Copidryas*, and is congeneric with our *C. Gloveri*. Berg's original description says of the frontal structure:—"Fronte valde prominenti, supra cornu complanato depressione declivi marginata fusca ornata." This character agrees well with *Copidryas*, but not with *Eudryas*, in which latter the front is not horned.

Of the colours of *Platensis*, Berg says, the hind-wings are ochraceous with broad and even pale fuscous marginal band, and compares the ornamentation with that of *unio*. There can thus be no shadow of doubt that my *E. cypris*, with its vermilion red unbanded secondaries and related to *E. grata* rather than to *unio*, is specifically and generically distinct. Berg uses *Euthisanotia* instead of *Eudryas*. Hübner's genus has mixed contents, and so far as I can see, from what literary material I have at hand, Boisduval was justified, in 1836, in proposing a new generic title for *grata* and *unio*.

Eudryas cypris, from Paraguay, is allied very clearly to our North American *E. grata*; it is perhaps a still handsomer species from the red colour of hind-wings and under surface. The *Eudriinæ* are generally quite pretty moths, while I think the palm for beauty must lie between *Eudryas cypris* and our North Am. *Ciris Wilsoni*.

AN ENTOMOLOGICAL TRIP TO COPPER CLIFF, ONT.

BY W. HAGUE HARRINGTON, OTTAWA.

In June, 1892, in company with Mr. Fletcher, who was anxious to obtain *Erebia Discoidalis*, Kirby, I made a visit to the famous Sudbury mining region. Leaving Ottawa on the 15th, at 3.40 p.m., we arrived at Copper Cliff at 5 a.m. the following day. As the hour was so early we tried a little collecting before calling on our friend, Mr. J. D. Evans, manager of the copper and nickel mines, who had kindly invited us to stay with him. Everything was rather moist, however; and but little could be found at this early hour except a few examples of *Banchus flavescens*. After breakfast, and some entomological discussions with our host, we sallied forth again, but showers interfered materially with collecting, and we were able to do little more than gain an idea of the character of our surroundings. The district, which is situated about long. 81 W., lat. 46.30 N., is in general somewhat similar in character to the description given by Dr. Hamilton, in a recent paper, of Sparrow Lake, from which it is distant about 150 miles in a north-westerly direction, while it is about 30 miles north of the Georgian Bay. This region is much broken with small hills and hummocks of Laurentian formation, which formerly were apparently covered by heavy forests of pine and other conifers, but which have been swept by fires, and now are sparsely clothed by a second growth of shrubs and small deciduous trees which are springing up among the burnt stumps and logs; while in numerous places the bare glaciated knobs of rock are exposed. Between the hills are occasional small areas of seemingly fertile soil, but usually these low places are swampy and contain the plants common to such moist habitats. The entrance to the Copper Cliff mine faces on a somewhat level piece of ground of moderate area, which has been converted into an artificial *solfatara*, where the glare of molten slag and the fumes of burning sulphur strongly remind one of a volcanic district. In the immediate vicinity of the roasting grounds, and for a radius of several hundred yards around, especially in the direction of the prevalent winds, vegetation has been completely destroyed by the sulphuric acid, with which every shower drenches the ground. Beyond the denuded area the effects are visible for a long distance in the discoloration and bleaching of the plants, which sometimes produce not unpleasant shades of colour or variegations of foliage. Near the mine a small stream flows down through a beaver-meadow, and further up it has been dammed to supply water for the mine. The stream is fringed with alder, willow,

cornel, etc., and the meadow, which has been caused by a former beaver-dam, is covered with coarse grass and sedges, and bordered by small spruce and tamarack.

The afternoon was brighter and Mr. Evans drove us down to Sudbury (about five miles), so that we might visit with him the locality where he had captured five examples of the desired *Erebia* on 12th May, 1889 (*Ottawa Naturalist*, Vol. III., p. 154.) It was of course a month later, but he was almost certain that he had seen one of these butterflies flit past the Sudbury Railway Station a week before, and we had hopes that we might obtain the coveted insect. Along the road every butterfly that flitted on ahead was anxiously watched, but each proved to belong to some commoner species. We collected many fine examples of *Phyciodes Nycteis*, which was very abundant and in perfect condition. We also obtained, under the loose bark of a stump, a pupa of this species which transformed to the imago during our visit.

From Sudbury we walked across the country in the direction of the Stobie mine; the ground being, as usual, rough and largely covered with ferns and brambles, interspersed with clumps of small poplars, birches, chokecherries, etc. No trace of *Erebia* could be found, but smaller and less remarkable insects occurred in fair numbers, including several species of saw-flies, of which *Tenthredo semirufa* was the most abundant. Black-flies (*Simulium*) were, however, so numerous and voracious that they made collecting very difficult, while they were ably assisted by the deer-flies (*Chrysops*.) I have had opportunities of becoming acquainted with such intrusive insects from the Atlantic to the Pacific, but I think that the black-flies of Sudbury could take first place for persistence of attack. Having separated from my companions, who carried the bottle of mosquito-oil, I was finally obliged to beat a retreat to the village, where my gory visage excited the risibilities of some of the inhabitants and induced them to size me up as a "tenderfoot." One mining individual went so far as to make some personal reflections on my "everlastingly chawed up" appearance, for which he afterwards apologized by stating that he had recently suffered in the same way himself, and he offered to confirm his unintention of giving offence, by inviting me to inspect the nearest poison (not fly) dispensary, hoping probably to find out if I was prospecting, or interested in mining areas.

Returning to Copper Cliff we spent a very pleasant and profitable evening examining the fine collections made by Mr. Evans in this district,

as well as those which he had gathered at Trenton. The next morning he advised us to go up along the beaver-meadow, and this proved to be the most interesting and profitable collecting ground which we found. Along the short wood-road leading up along the brook to the meadow, *Carterocephalus Mandan* occurred abundantly and a few other butterflies were not uncommon, while coleoptera and hymenoptera were moderately plentiful. In the meadow itself we captured a number of interesting species, of which the rarest was *Nematoplus collaris*, which has not been recorded from Canada. Four examples were taken of this beetle and an equal number of *Dolichosoma foveicolle*, a species which at Ottawa has only been once taken, in a similar habitat. *Næmia episcopalis* was common with *Anisoticta strigata*, and several examples of *Ditylus caruleus* occurred on low plants. *Orsodacna atra* was exceedingly abundant, and variable both in size and colour, and several species of Lampyridæ were more or less common. In the sluggish stream which divided the meadow, *Donacia proxima* was as usual on lily-pads, while *D. distincta*, *D. subtilis* and *D. emarginata*? were swept from the fringing sedges and shrubs. Of hymenoptera the most conspicuous was *Trichiosoma triangulum*, upon small willows and spiræas. Some fifty or more were taken, which, with few exceptions, were males. Along the borders of the adjacent wood several fine ichneumons were taken, including males of *Coleocentrus Pettitii*, of which Mr. Fletcher subsequently obtained females (CANADIAN ENTOMOLOGIST, Vol. XXV., page 30.) A pleasant breeze tempered the heat and kept off the flies, so that we were enabled to collect most pleasantly.

The afternoon was spent upon the adjacent hillocks, among the stumps and debris of the old burnt woods, which formerly had yielded to Mr. Evans large numbers of longicorns, etc., but which were then too old to be longer tenanted by such insects. Several of the larger Pimplinæ occurred here, such as *Coleocentrus*, *Ephialtes*, *Euxorides*, *Xylonomus* and *Ecthrus*. Hibernated specimens of *Vanessa antiopa* and some skippers were the only butterflies observed. Willows yielded numerous examples of the pretty little weevil *Rhynchites cyanellus*, also *Orchestes ephippiatus*, *O. subhirtus*, *Lepyrus geminatus*, etc.; spiked maples in bloom furnished several elaters and some small bees and other hymenoptera, while a fine male of *Agrilus acutipennis* was captured on birch. In the evening we made, under the guidance of our host, an inspection of the extensive smelting works, and were extremely interested in the

several operations required to produce the large cakes of copper and nickel known as *matte*. The molten slag poured out on the dump-heaps lit up the country for miles around and produced a very weird effect all night. Mr. Fletcher had to leave for Ottawa by the night train, but I remained two days longer and went over the same routes and somewhat extended the area of investigation, but did not materially enlarge our list of captures. A species of *Diodontus* (which I have not yet been able to place with any of the described forms) was somewhat common, generally at rest on leaves of maples, but not many specimens were collected as the foliage was too damp for sweeping and the insects were too nimble to be easily taken with the fingers alone. *Oryssus Sayi* was taken upon a burnt pine tree, so that possibly it may infest this tree as well as the maple and poplar.

The last day of my stay was so wet that no collecting could be done. Mr. Evans did indeed go with me in the morning to the beaver-meadow, where we waded about through the wet grass, but the rain became so heavy that all the insects disappeared, except mosquitoes, which were exceptionally numerous and aggressive. My time was, however, not unprofitably or unpleasantly spent, as fuller opportunity was afforded for further examination of the extensive collection of beautifully prepared specimens which has been gathered by Mr. Evans, and in which are many rare and interesting species. Each evening numerous moths were taken upon the study window screen, to which they were attracted by a light arranged so as to serve for that purpose as well as for the preparation of accumulated material.

To give some idea of the insects which may be taken in two or three days at the season in question (middle of June), I append a list of the species we collected, with the hope that at no late date our esteemed friend and co-worker, Mr. Evans, will publish his promised catalogue of the large and valuable collection he has made in this little-known region. No attempt was made to collect Lepidoptera other than butterflies, or Diptera (except a few of the larger species), while Orthoptera and Neuroptera were too few in number to be worth recording :—

LEPIDOPTERA.

Papilio Turnus, Linn. Common.

Pieris Napi, Esp., winter form *Oleracea-hyemalis*, Harris. Several.

Colias Philodice, Gdt.

Argynnis Myrina, Cram. Common in beaver-meadow.

- Argynnis Bellona*, Fab.
Phyciodes Tharos, Dru. Common along wood-road.
Phyciodes Nycteis, Doub-Hew. Common along roads.
Grapta Progne, Cram. One specimen.
Vanessa Antiopa, Linn. Hibernated individuals.
Neonympha Eurytris, Fab.
Lycæna Pseudargiolus, Bd.-Lec. ; winter form *Lucia*, Kirby. Not rare,
 flitting over bushes of spiked-maple in flower.
Lycæna Comyntas, Gdt.
Feniseca Tarquinius, Fab.
Chrysophanus Hypophlæas, Bdv.
Carterocephalus Mandan, Edw. Abundant in wood-roads and openings.
Pamphila Zabulon, Bd.-Lec. In open woods.
Pamphila Zabulon, Lin., aberrant ♀ *Pocahontas*, Scud.
Pamphila Peckius, Kirby. In grassy localities.
Pamphila Mystic, Edw. Along borders of woods.
Nisoniades Icelus, Lint Common along wood-road.
Nisoniades Brizo, Bd.-Lec.
Eudamus Pylades, Scud. Border of woods.

HYMENOPTERA.

TENTHREDINIDÆ—*Cimbex americana*, Leach, var. *La Portei*, St. Farg. ♂; *Trichiosoma triangulum*, Kirby; *Hylotoma McLeayi*, Leach ♀; *H. clavicornis*, Fab., ♀; *Nematus corniger*, Norton; *N. pallicornis*, Norton; *Dolerus aprilis*, Norton; *D. sericeus*, Say; *Monophadnus tibia*, Norton, ♂; *Monostegia maculata*, Norton; *Selandria flavipes*, Norton; *Macrophya flavicoxæ*, Norton; *M. contaminator*, Prov., ♀; *M. n. sp. (?)* ♀; *M. trisyllaba*, Norton; *M. varia*, Norton, ♂; *Pachyprotasis delta*, Prov.; *Taxonus rufipes*, Harr., ♂; *Strongylogaster apicalis*, Sey, ♂ ♀; *S. soriculatus*, Prov., ♀; *S. annulosus*, Norton, ♀; *Tenthredo rufipes*, Say, ♀; *T. verticalis*, Say, ♀; *T. semirufa*, Norton, ♀; *T. signata*, Norton? ♂ (probably the ♂ of *semirufa*); *T. n. sp. (?)* ♀; *T. ruficolor*, Norton (?) ♀; *Pamphilus ocreatus*, Say, ♀.

UROCIDÆ—*Oryssus Sayi*, Westwood, ♀.

CYNIPIDÆ—*Figites (Figitodes, Ash.) inermis*, Prov. ♂.

ICHNEUMONIDÆ—*Ichneumon malacus*, Say, ♀; *I. acerbus*, Cress., ♂; *I. subcyaneus*, Cress., ♂; *I. parvus*, Cress., ♂; *I. canadensis*, Cress., ♀; *I. nigrovariegatus*, Prov. (?) ; *I. terminalis*, Cress., (?) ; *Amblyteles stadaconensis*, Prov. ♂; *A. perluctuosus*, Prov., ♀.

Phygadeuon n. sp., ♀; *Cryptus proximus*, Cress., ♀; *C. nuncius*, Say, ♀; *C. canadensis*, Prov., ♂; *C. n. sp.*, ♀; *Pezomachus sp. (canadensis)*, Cress., ? ♂).

Exochilum fuscipenne, Norton, ♀; *Anomalon anale*, Say, ♀; *Paniscus albotarsatus*, Prov., ♂ ♀; *Campoplex sp.*; *Casinaria n. sp. (?)*, ♀; *Limneria*, 3 sp. not determined; *Bauchus flavescens*, Cress., ♀; *B. canadensis*, Cress., ♂; *B. borealis*, Cress., ♀; *B. spinosus*, Cress. (?), ♀.

Mesoleptus, n. sp. (?); *Mesoleius sp. (?)*; *Tryphon analis*, Cress., ♂; *T. tibialis*, Cress., ♂; *Erromenus crassus*, Cress., ♀; *E. pedalis*, Cress., ♀; *E. (?) n. sp. (?)*; *Cteniscus, sp.*; *Exyston clavatus*, Cress., ♀; *Exochus laevis*, Cress., ♂; *Orthocentrus sp.*

Coleocentrus Pettitii, Cress., ♂ ♀; *Ephialtes sp. (near gigas, Walsh)*; *Pimpla conquisitor*, Say, ♂ ♀; *P. tenuicornis*, Cress., ♂ ♀; *P. rufopectus*, Cress., ♀ var.; *Glypta erratica*, Cress., ♀; *Meniscus superbus*, Prov., ♀; *Phytodietus vulgaris*, Cress., ♀ var.; *Euxorides americanus*, Cress., ♂ ♀; *Xylonomus stigmapterus*, Say, ♂ ♀; *Odontomerus mellipes*, Say, ♀; *Ecthrus abdominalis*, Cress., ♀.

BRACONIDÆ.—*Bracon longicauda*, Prov.; *Rhogas parasiticus*, Norton; *Meteorus vulgaris*, Cress.; four undetermined species.

CHALCIDIDÆ.—*Eurytoma, sp.*; one Pteromalid undetermined.

PROCTOTRYPIDÆ.—*Isobrachium, sp. (?)*.

CHRYSIDIDÆ.—*Omalus leviventris*, Cress.; *Elampus speculum*, Say; *Notozus viridicyaneus*, Norton; *Chrysis cærulans*, Fab.

POMPIDIDÆ.—*Agenia pulchripennis*, Cress.

PEMPHREDONIDÆ.—*Cemonus inornatus*, Say; *Pemphredon concolor*, Say; *Passalacus mandibularis*, Cress.; *Diodontus sp.*

CRABRONIDÆ.—*Rhopalum pedicellatum*, Pack.; *Crabro bellus*, Cress., 3 ♂; *C. atrifrons*, Cress. (?), ♂; *C. effossus*, Pack., ♀; *C. 6-maculatus*, Say; *C. maculipennis*, Smith, ♂; *C. sp.*, undetermined ♂.

EUMENIDÆ.—*Eumenes fraternus*, Say, ♂; *Odynerus arvensis*, Sauss., ♀ ♂; *O. leucomelas*, Sauss., ♂; *O. tigris*, Sauss., ♂; *O. albophaleratus*, Sauss., ♀; *O. debilis*, Sauss., ♂.

VESPIDÆ.—*Polistes pallipes*, St. Farg., ♀; *Vespa maculata*, Linn., ♀; *V. scelestæ*, McFar., ♀.

ANDRENIDÆ.—*Prosopis basalis*, Smith, ♂; *Sphecodes dichroa*, Smith, ♀; *Halictus coriaceus*, Smith (?), ♀; *H. confusus*, Smith (?), ♀; *Andrena hilaris*, Smith (?), ♀.

APIDÆ.—*Nomada bisignata*, Say, ♀; *Osmia lignaria*, Say, ♀; *O. similima*, Smith, ♀; *Apathus Ashtonii*, Cress., ♀; *Bombus ternarius*, Say, ♀.

COLEOPTERA.

CARABIDÆ.—*Pterostichus lucublandus*, Say; *P. patruelis*, Dej. *Bradycellus neglectus*, Lec. (?) or n. sp.

HYDROPHILIDÆ.—*Helophorus lineatus*, Say.

STAPHYLINIDÆ.—*Listrotrophus cingulatus*, Grav.; *Stenus* sp., a small specimen since lost; *Anthobium pothos*, Mann.

COCCINELLIDÆ.—*Anisosticta strigata*, Thunb.; *Næmia episcopalis*, Kirby; *Hippodamia 5-signata*, Kirby; *H. 13-punctata*, Linn.; *Coccinella trifasciata*, Linn.; *C. transversalis*, Muls.

CRYPTOPHAGIDÆ.—*Loberus impressus*, Lec.

DERMESTIDÆ.—*Byturus unicolor*, Say.

DASYLLIDÆ.—*Cyphon variabilis*, Thunb.

ELATERIDÆ.—*Elater pullus*, Germ.; *E. luctuosus*, Lec.; *E. nigricans*, Germ.; *E. rubricus*, Say; *E. apicatus*, Say; *Agriotes oblongicollis*, Melsh.; *Dolopius lateralis*, Esch.; *Melanotus castanipes*, Payk.; *M. sp.* (probably a small form of preceding); *Limoniæ æger*, Lec.; *Campylus denticornis*, Kirby; *Sericosomus incongruus*, Lec.; *Corymbites tarsalis*, Melsh.; *C. triundulatus*, Rand.; *C. æripennis*, Kirby; *C. metallicus*, Payk.; *C. n. sp?* (one specimen.)

THROSCIDÆ.—*Throsus constrictor*, Say.

BUPRESTIDÆ.—*Dicerca divaricata*, Say; *Melanophila longipes*, Say; *Agrilus acutipennis*, Mann.; *Brachys ærosa*, Melsh.

LAMPYRIDÆ.—*Plateros modestus*, Say; *Ellychnia corrusca*, Linn.; *Podabrus diadema*, Fab.; *P. modestus*, Say; *P. piniphilus*, Esch.; *F. lateralis*, Lec.; *Silis percomis*, Say; *Telephorus fraxini*, Say (?); *T. rectus*, Melsh. (?); *T. tuberculatus*, Lec.; *Malthodes* sp.

MALACHIDÆ.—*Dolichosoma foveicollis*, Kirby.

CLERIDÆ.—*Hydnocera difficilis*, Lec.

LUCANIDÆ.—*Platycerus depressus*, Lec.

SCARABÆIDÆ.—*Aphodius hamatus*, Say.

CERAMBYCIDÆ.—*Clytanthus ruricola*, Oliv.; *Achmæops proteus*, Kirby; *Leptura sexmaculata*, Linn.; *L. chrysocoma*, Kirby; *L. sphericollis*, Say; *L. mutabilis*, Newm.

CHRYSOMELIDÆ.—*Donacia proxima*, Kirby; *D. distincta*, Lec.; *D. subtilis*, Kunze; *D. emarginata*, Kirby (?); *Orsodacna atra*, Ahr.;

Syneta ferruginea, Germ. ; *Pachybrachys hepaticus*, Melsh. ; *Diachus catarius*, Suff. ; *Chrysomela Bigsbyana*, Kirby ; *Gastroidea polygona*, Linn. ; *Lina lapponica*, Linn. ; *Gonioctena pallida*, Linn. ; *Adimonia cavicollis*, Lec. ; *A. rufosanguinea*, Say ; *Ædionychis quercata*, Fab. (?) ; *Haltica bimarginata*, Say ; *H. ignita*, Ill. ; *Crepidodera Helxines*, Linn.

CISTELIDÆ—*Hymenorus pilosus*, Melsh.

LAGRIIDÆ—*Arthomacra ænea*, Say.

CEDEMERIDÆ—*Ditylus cæruleus*, Rand.

MORDELLIDÆ—*Anaspis atra*, Lec. ; *A. flavipennis*, Hald. ; *A. rufa*, Say.

ANTHICIDÆ—*Nematoplus collaris*, Lec.

PYROCHROIDÆ—*Schizotus cervicalis*, Newm.

RHYNCHITIDÆ—*Rhynchites cyanellus*, Lec. ; *Rhynchites* (?) *sp.* (a small brownish weevil).

ATTELABIDÆ—*Attelabus rhois*, Boh.

CURCULIONIDÆ—*Lepyrus geminatus*, Say ; *Pissodes affinis*, Rand. ; *Hylobius confusus*, Kirby ; *Erycus puncticollis*, Lec. ; *Anthonomus signatus*, Say ; *A. sp. nov.* ? ("marked exactly like *scutellatus*, but more elongate," Dr. Hamilton) ; *Orchestes pallicornis*, Say ; *O. niger*, Horn ; *O. ephippiatus*, Say ; *O. subhirtus*, Horn ; *Elleschus bipunctatus*, Linn. ; *Cæliodes tenuipes*, Lec. ; *Ceutorhynchus decipiens*, Lec.

SCOLYTIDÆ—*Dryocates septentrionis*, Mann. ; *Hylurgops pinifex*, Fitch.

HEMIPTERA.

HETEROPTERA.—*Eurygaster alternatus*, Say ; *Perillus exaptus*, Say ; *Podisus modestus*, Dallas ; *Neottiglossa undata*, Kirby ; *Cosmopepla carnifex*, Fab. ; *Euchistus fissilis*, Uhl. ; *Corizus punctiventris*, Dallas ; *Cymus augustatus*, Stal., common ; *Miris affinis*, Reut. ; *Lygus flavonotata*, Prov. (?) ; *Camptobrochis grandis*, Uhl. ; *Anthocoris musculus*, Say ; *Aradus rectus*, Say ; *Aradus* (two species unnamed) ; *Coriscus inscriptus*, Kirby.

HOMOPTERA.—*Pubilia concava*, Say ; *Cixius stigmatus*, Say ; *Stenocranus dorsalis*, Fitch ; *Lephyronia quadangularis*, Say ; *Bythoscopus sobrius*, Walker ; *B. variabilis*, Fitch ; *B. pruni*, Prov. (?) ; *Idiocerus alternatus*, Fitch ; *Agallia novella*, Say ; *Tettigonia hieroglyphicus*, Say ; *Thamnotettix subcupræus*, Prov.

SUMMARY.

The species enumerated in the foregoing lists are as follows :—Lepidoptera (Butterflies) 21, Hymenoptera 125, Coleoptera 102, Hemiptera 27, making a total of 275.

SOME UNDESCRIBED STAGES OF NOCTUID LARVÆ.

BY HARRISON G. DYAR, NEW YORK.

RAPHIA FRATER, *var. COLORADENSIS*, Put.-Cr.

Mature larva.—Head rounded, partly retracted under joint 2, waxy greenish-white, ocelli black; mouth white. Body of nearly uniform width, joint 13 smaller; segmental incisures deep. Colour translucent, clear green, with many yellow piliferous dots, on joints 3 and 4 the dorsal ones tipped with red, and a central pair of these are prolonged into short, contiguous processes. On joints 5, 9 and 12 each, a transverse, curved, yellow band, reaching to the first dot above the spiracle. These bands are whitish anteriorly, those on joints 9 and 12 partly bordered in front with crimson. Feet green, the anal pair tipped with yellow and crimson. Spiracles small, black. There are 8 of the piliferous dots on each side of a segment, besides a dorsal row of non-piliferous ones.

Cocoon.—Hard and firm; composed of bits of dirt and stones spun together.

Pupa.—Cylindrical, abdomen rounded, its segments appressed; cremaster very short, but broad and thick, without hooks. Cases and central portion of abdominal segments densely and finely wrinkled. Colour, chestnut; width, 5 mm.

Food-plant.—Poplar. Larvæ from Yosemite, California.

ACRONYCTA RADCLIFFEI, Harvey.

Dr. Thaxter has described the mature larva, and noted that it mimics *Datana* larvæ.

Larva before last moult.—Head bilobed, shining, the tops of the lobes brown, the front and sides mottled with large blotches of pink, the back of the head white, the clypeus and an area outside of it, green; mouth and ocelli brown; width, 2.4 mm. A few hairs arise from the head. Body enlarged dorsally on joint 12, with five rows of warts on each side, one on each segment and each bearing a black hair. Cervical shield black; a broad brown dorsal stripe, containing a red line centrally and edged with yellow, covering the first two rows of warts and ending at joint 12; the rest of the body is green with a faintly indicated white stigmatal line. Spiracles small, black rimmed.

After last moult.—Head bilobed, slightly shagreened but shiny, and furnished with a few hairs; colour black, the upper third in front, reaching to the upper half at the sides and posteriorly, orange-red; width, 3.3 mm. Body enlarged a little dorsally at joint 12; cervical shield with two rows of small warts, black, as are also the anal plate and feet. Warts small, some minute, about 24 per segment, besides those on the venter of the legless segments; warts pale, bearing thin, long, whitish hairs (7 mm.) Body black, paler ventrally, a dorsal red line from joints 3 to 11; two lateral and one substigmatal pale yellow lines, the upper one reaching from joints 3 to 11, the lower two from joints 2 to 12, confluent posteriorly. The substigmatal band is broader than the others and reaches narrowly to the top of joint 13, sending a branch to the top of joint 12, to which branch the two other lateral lines barely reach. Spiracles white. As the stage advances the dorsal line fades to the colour of the others.

Food-plant.—Wild cherry (*Prunus serotina*).

Larvæ from Rhinebeck, New York.

ACRONYCTA IMPLETA, Walker.

subochrea, Grote.

Larva, about half grown.—Head subquadrate, notched on vertex, the lobes pointed anteriorly; pale whitish, with eight pale brown spots: one covering the eyes, one before apex of each lobe, and two smaller ones respectively above and below and below the other two. Body deeply incised between the segments. Feet normal. Warts arranged as in the Arctiidae and Liparidae; row i. on joints 5–12 in subdorsal space; row ii. subdorsal; row iii. superstigmatal; row ix. obsolete; rows v. and vi. in the subventral space. All concolorous with the markings. Colour pale translucent yellowish, with a white subdorsal line below warts ii. Warts ii. and iii. on joint 2, and ii. on joint 3, brown. Brown patches dorsally on joints 5, 6 and 9, and irregular ones on joints 11 and 12. Hairs blackish, fine, not abundant.

Food-plant.—Witch-hazel (*Hamamelis virginica*).

Larvæ from Rhinebeck, New York.

PERIDROMA INCIVIS, Guen.

Egg.—Irregularly spherical, the base flattened; vertically striated, the

striæ becoming irregular near the vertex where they meet. Colour pale yellow. Diameter about 0.5 mm. Laid in a single layer, the eggs contiguous to each other.

First stage.—Geometriform. Head round, brownish. Body semi-transparent whitish with a purple shade, and small black dots. Thoracic feet black, the abdominal ones well developed only on joints 9, 10 and 13. Later it becomes more as in the next stage in markings.

Second stage.—Head semi-transparent, almost colourless but with a reddish-tinge; ocelli black, jaws brown; a brown line along the side; width, about 0.6 mm. Body green, a distinct brown stigmatal line with two more above it but less distinct. Another line in the subventral space. A few short, black setæ. Feet all concolorous with body. The larvæ walk like geometers.

Third stage.—Head shining, pale whitish with two faint brownish bands in front, divergent basally; a distinct band at side of head covering eyes, preceded by a fainter one; mouth brownish; width, 0.9 mm. Body grass-green with five dark brown lines on each side, the upper ones rather faint, the stigmatal one very distinct, the subventral one diffuse. Between these last two is a broad white band. Feet all present, but the two anterior pair of abdominal ones much smaller than the others. The larvæ still walk with a looping motion, but less decidedly than before.

Fourth stage.—Head grass-green, shining, marked as before, but the mouth whitish; width, 1.3 mm. Joint 12 slightly enlarged. Colour grass-green; a geminate, dorsal, brownish line, continuing the front lines of head; a pale, obscure, subdorsal and a superstigmatal line, each edged with brownish above; a broad dark brown stigmatal band, below which the substigmatal ridge is white. Thoracic feet semi-transparent. The spiracles on joints 2 and 12 are white. Later, a brownish-red band appears in the centre of the white band.

More rarely the head is very pale whitish-brown, marked as above. Body reddish-brown, somewhat mottled with darker brown. Markings the same, but there are six faint, narrow lines between the dorsal and substigmatal ones.

Fifth stage.—*Brown form.* Head very pale brownish, marked with black on the clypeus, two broad lines divergent basally and three bands at the side, connected by mottlings; eyes black, jaws brownish, antennæ

pale; width, 2 mm. Body pale brown, mottled with dark brown, more thickly along the longitudinal lines. A row of subdorsal brown spots, smaller at the extremities. Subdorsal and lateral lines faint, narrow, double, irregular. Substigmatal band broad, pinkish-brown, edged on both sides with white, extending on to the feet of joint 13. Piliferous spots small, black. Spiracles white, those on joints 2 and 12 large. Abdominal feet nearly equally developed, the larva walking normally, no longer geometriform.

Green form.—Head pale green, marked the same, but less distinctly. Body grass-green, finely mottled with white, with the faint, narrow, irregular dorsal, double subdorsal and lateral white lines and substigmatal band as above.

Sixth stage.—Head shining pale whitish-brown; antennæ and mouth paler; jaws tipped with black; ocelli black. Down the front of the head extend two broad, black bands, diverging on either side of the clypeus and ending before reaching the mouth. These are connected by mottlings with a fainter band before the eyes on each side. Behind the eye are three more bands, irregular and partly connected. An obscure white band runs from base of antennæ to meet the substigmatal line on the body. A few setæ. Width, 3 mm. Body pale brown, mottled with black and a little white on the dorsum, the latter mostly in narrow dorsal, subdorsal and traces of the other lines. A subdorsal row of black diffuse spots, more distinct on the middle segments. Substigmatal band pinkish, edged with white. Piliferous spots small, white, those on the venter black.

Food-plant.—Fed on bur-grass (*Cenchrus tribuloides*).

Larva from Lake Worth, Florida.

HADENA EVELINA, French.

Head sordid green; ocelli black; width, 2.5 mm. Body green, mottled with white; a narrow, dorsal, white line and traces of a subdorsal one in segregations of the mottlings; a distinct, but narrow stigmtal white line, passing below the spiracle on joint 12 and on to the anal foot. Spiracles black ringed. Piliferous dots not distinct. Later the colour is pale brown, sparsely mottled with black. Head brown, reticulated with dark brown. Anal plate and cervical shield dark brown, the latter edged in front with black. The mottlings give the appearance of oblique segmental shades. Piliferous dots black, narrowly surrounded by white.

Food-plants.—Lupine (*Lupinus*) and wild currant (*Ribes*).

Larvæ from Yosemite, California.

XVLOMIGES SIMPLEX, Walker.*crucialis*, Harvey.

Head black, smooth, shining; labrum and bases of antennæ pale yellow; width, 2.6 mm. Body not distinctly enlarged at joint 12, but joint 13 small. Piliferous tubercles very large, shiny brownish, each with a single hair. Body sordid greenish-white, of no decided colour, slightly translucent. A dorsal and subdorsal paler white lines. A broad pale yellow stigmatal line, shaded with orange centrally, continued narrowly and indistinctly on to the anal feet. Spiracles black.

Last stage.—Head bright shining red-brown; labrum and bases of antennæ white; jaws and ocelli black; width, 4 mm. Thoracic feet pale red-brown. Body sordid, subtranslucent white. Dorsal and subdorsal lines narrow, faint, white. Stigmatal line broad, pale yellow, enclosing the black spiracles. Piliferous dots small, black, with somewhat elevated larger bases. Under a glass the body appears mottled with white.

Food-plants.—Willow (*Salix*) and wild currant (*Ribes*). The larvæ live singly in houses made of leaves lined with silk, closed except for a hole at one end.

Found at Yosemite, California.

ACONTIA ERASTROIDES, Guen.

Egg.—Conical, flat at base, with 14 longitudinal ribs, the alternate ones slightly projecting at the top, the others not reaching quite so far. Besides these are many transverse ridges, but slightly elevated. Colour uniform green; width, 0.25 mm.; height, 0.35 mm.

First larval stage.—Geometriform, with only 10 well-developed legs. Green, a transverse band around each segment brownish, somewhat elevated. Head, cervical shield and thoracic feet black.

Larvæ from Rhinebeck, New York.

CATOCALA CEROGAMA, Guen.

Ash-gray, with many longitudinal rows of black points. Two black elevations on joint 12. Venter yellowish-green, this colour separated from the dorsal gray by a subventral line of white fringe-like processes. Head gray with black markings; joint 2 spotted with black.

Food-plant.—Linden (*Tilia americana*).

Larva from Ulster Co., New York.

THE MOTTLED UMBER MOTH.

(Hibernia defoliaria, L.)

BY JAMES FLETCHER, OTTAWA.

Some years ago I received from the Rev. G. W. Taylor, of Victoria,



THE MOTTLED UMBER MOTH; MALE AND WINGLESS FEMALE; CATERPILLAR AFTER TASCHENBERG. (Figure kindly lent by Miss E. A. Ormerod).

Vancouver Island, a specimen of the Mottled Umber Moth. This had been named by the Rev. G. D. Hulst, of Brooklyn, and was, I believe, the first specimen of the species recorded as taken in America. Later, in 1889, two specimens were forwarded from the same place by Mr. W. H. Danby. Since that time,

although looked for regularly at the time the males fly in autumn, none had been observed until this year, when the larvæ were so abundant that they caused considerable injuries to plum and cherry trees.

The following interesting letter on the occurrence of this insect last season is from Mr. W. H. Danby:—

"Dec. 7, 1893.—*H. defoliaria* has been wonderfully plentiful this year in comparison with other seasons. During June and in the early part of July, the larvæ were a pest in most orchards and gardens, and they fed upon cherry and plum, seeming to prefer the plum. None were seen on apple. In one garden a young cherry tree, 6 feet high, had a quantity on it, and the plum trees suffered considerably from the voracity of the larvæ; but the apple trees in the same garden were not affected. I forwarded larvæ to you June 20th, and placed others in a breeding cage, being lucky enough to successfully rear several to the imago. I am glad to know that you also bred the imago. In 1889, I took 3 males in Victoria, and since then have looked for it everywhere in vain till this season, when the larvæ swarmed. The imagos began to appear about November 15th, and the electric lights proved as usual to be a great attraction. On the doorways of two hotels I collected eight dozen in one morning, and every day after that more or less were to be found on the stone walls of the aforesaid hotels. One peculiar result of the electric light drawing the male imagos from all quarters to the centre of the city was that in places where they had emerged from pupæ very few males were to be seen, while the apterous ♀ was found to be common. The sexes seem to average about 1 ♀

to 6 ♂♂, or say 15% are ♀♀. I have made enquiries and fail to find that the larva was seen on apple, whilst everyone I have interviewed on the subject noticed the cherry and plum trees being attacked; still, the larvæ may have fed on apple in places not visited by me, and as you say, 'but surely they also fed on apple,' I presume they do, and I will next year keep a look out for them and watch closely what they do feed on.

"The markings of the males vary very much; I have a series of 6 which are wonderfully unlike each other; in fact, *H. defoliaria* varies in its markings just as much as *C. Bruceata* or *E. Somnaria* do, and some are beautiful by the very reason of their wonderful contrast to the type—while one has the bands nearly black, another has apparently no median band, but is thoroughly suffused.

"The females are fond of climbing to the top of the fence rails and sunning themselves. They have very long legs, it seems to me, so much so that they have trouble in walking. Most of the imagoes bred by me were females."

The caterpillars sent me by Mr. Danby were received at Ottawa on June 28th, and were full grown. They pupated in a few days, most of them on the surface of the ground, but some a short distance beneath. A few specimens were parasitized by the larvæ of a Tachinid fly. The first moth, a male, emerged on November 27th, so that the pupal stage lasted almost five months. The pupa is smooth, dark reddish-brown, nearly $\frac{3}{4}$ of an inch in length, and has the last segment terminated by a stout spine. The moth is of a dull ochre-brown hue, expanding $1\frac{3}{4}$ inches, and has the upper wings dotted and crossed diagonally by two dark waved bands; the space between these two bands is pale and bears a dark discal spot; the lower wings are paler than the upper, and like them sprinkled with brown dots and have a dark spot near the middle. The female moth is brown with two rows of conspicuous spots down the back. The wings in this sex are almost entirely aborted.

The occurrence of this insect at Victoria is worthy of note, as in England it is one of the worst orchard pests. In England, however, it is chiefly an apple pest, and it is rather strange that it has not been found on apple trees in British Columbia. Miss E. A. Ormerod says as to the food of the Mottled Umber Moth:—"The caterpillars are very abundant, and very injurious to the leafage of various kinds of fruit and forest trees, as oak, lime, etc. They have been especially noted as feeding at times on unripe cherries, gnawing away one side of the fruit." ("Manual of Injuri-

ous Insects," p. 337.) The habits of this moth are very similar to those of our canker worms (*Anisopteryx*). When the moths appear in the autumn, the females crawl up the trunks of trees and lay their eggs on the branches. In this condition the insect passes the winter.

The following description of the larvæ was taken from the British Columbian specimens sent by Mr. Danby:—

Mature Larva.—Length, $1\frac{1}{4}$ inches. Head, round, bilobed at apex, chestnut-red, mottled. Mouth parts darkened. Dorsal region reddish-brown, darkened with fine black broken lines arranged as follows: A dorsal double stripe which widens a little in the middle of each segment and is shaded with pale yellow; two narrow subdorsal lines, rather indistinct, and placed on a reddish field; a double lateral stripe, the lower line of which is distinct and sinuous. Beneath this dorsal area the stigmatal area is bright yellow. The spiracles themselves are white, ringed with black, and are in the centre of blotches of reddish-brown shaded anteriorly with black. Ventral area, including thoracic feet and prolegs, pale yellow. Some specimens are much darker than others; in the darkest there is a broken supraventral stripe just beneath the substigmatal fold, sometimes running up on to it. The prolegs on 10th segment are also sometimes darkened exteriorly.

I believe the British Columbian insect to be identical with the English, as I can find no difference between either the moths or the caterpillars.

DESCRIPTIONS OF TWO NEW HYMENOPTEROUS PARASITES FROM WATER BEETLES.

BY WILLIAM H. ASHMEAD, WASHINGTON, D. C.

I can find no record of the breeding of Hymenopterous parasites from water beetles, in either the European or American faunas, and it is, therefore, with considerable pleasure that I here describe two distinct species of Hymenopterous insects, reared from water beetles by Mr. H. F. Wickham, of Iowa City, Iowa, belonging in genera not yet reported as occurring in our fauna.

The genus *Gausocentrus* is one of Förster's new genera erected in his "Synopsis der Familien und Gattungen der Ichneumoniden," 1868, p. 198, and appears a valid one, although, so far as I am aware, it still remains unrecognized by European authorities.

Cyrtogaster, Walker, is a well-known European genus well represented in our fauna, although now noticed for the first time, my collection containing not less than seven undescribed species. Kirchner records eleven described species in Europe.

SUB-FAMILY TRYPHONINÆ.

Tribe *Mesoleptini*.

Genus *Gausocentrus*, Förster.

1. *Gausocentrus gyrini*, sp. n.

♂.—Length, 3.5 to 3.8 mm. Black, shining, impunctate, clothed with a sparse, fine greyish pubescence, more apparent on face and metapleura, the apex of second abdominal segment broadly margined with red; petiole and second segment towards base subopaque, the former channeled, the latter feebly aciculated basally; petiole very long, rather slender and nearly as wide at base as at apex, about one-fourth longer than the second segment; third segment about two-thirds the length of second; fourth about half the length of third; following segments a little shorter subequal.

Head transverse, a little wider than the widest part of thorax, polished, except the face, which is feebly rugulose; clypeus subconvex, polished, truncate at apex; eyes larger, extending nearly to the base of mandibles; palpi pale or yellowish; mandibles pale rufous, bi-dentate, the teeth subequal; antennæ long, filiform, 20-jointed, reaching to base of second abdominal segment, the scape and pedicel obscure rufous, stouter than the flagellum and together not quite as long as the first flagellar joint, the flagellum black, cylindrical, of a uniform thickness throughout, finely pubescent, the joints gradually shortening toward apex.

Thorax smooth, with two well-defined parapsidal furrows; pronotum contracted, much narrower than the mesonotum; scutellum with a deep transverse depression at base, behind which it is convexly elevated; metathorax areolated above, rounded off posteriorly, with the pleura finally rugose; tegulæ and legs, including all coxæ, brownish-yellow, or pale ferruginous, the middle and hind tarsi and the posterior tibiæ above, subfuscous; tibial spurs, 1, 2, 2, not conspicuous; wings hyaline, the large stigma and venation dark brown; areolet pentagonal; second discoidal cell only about half the length of the third, the discoidal nervure very obtusely angulate a little before the middle of the third discoidal cell.

Hab.—Independence, Iowa.

Bred by Mr. H. F. Wickham, from pupa of a water beetle, *Gyrinus* sp.

FAMILY CHALCIDIDÆ.

SUB-FAMILY PTEROMALINÆ.

Tribe *Sphegigastrini*.Genus *Cyrtogaster*, Walker.2. *Cyrtogaster dineutis*, sp. n.

♀.—Length, 2.5 to 2.65 mm. Bronze-green, confluent punctate; sides of thorax and beneath bluish, or blue-green, with a conspicuous smooth triangular cupreous spot beneath the insertion of hind wing; metapleura with some long greyish hairs; palpi fuscous; mandibles piceous, or rufo-piceous; scape, pedicel and legs, except coxæ, brownish-yellow; flagellum black or brown-black; coxæ metallic-green; wings hyaline, the nervures pale.

The head is broadly transverse, wider than the widest part of mesothorax, or a little more than three times as wide as thick antero-posteriorly, the punctation finer on face and towards the clypeus, the latter with some fine converging striæ; antennæ 13-jointed, inserted a little below the middle of the face, the flagellum subclavate, about one and a-half times as long as the scape; pedicel long, longer than the first flagellar joint and the two ring-joints combined; flagellar joints, after the first, wider than long. Thorax with the parapsidal furrows indicated only anteriorly, the pronotum transverse, much narrower than the mesonotum, the metanotum much produced at apex, confluent punctate, with a carina above; wings hyaline, the apical two-thirds pubescent, the basal one-third bare; the marginal and post-marginal nervures are nearly equal in length, about one-third longer than the stigmal, the stigmal nervure ends in a small stigma with a slight uncus.

Abdomen short ovate, attached to the produced portion of the metathorax by a short but distinct petiole, the segments two and three very large, occupying most of the surface, the second with a deep emargination at base, the segments after the third very short, subequal, all united not longer than the third.

Hab.—Independence, Iowa.

Bred by Mr. H. F. Wickham from the pupa of *Dineutes assimilis*, obtained September 1, the flies issuing September 11 and 12.

This species is probably only a secondary parasite, judging from other bred species of the genus in my collection.

BOOK NOTICES.

THE BUTTERFLIES OF NORTH AMERICA: By W. H. Edwards. Third Series. Part XIII.

Another part of Mr. Edwards's magnificent work has been received, and is of particular interest to Canadian students. The three beautiful plates represent the following:—Plate I., *Neominois Ridingsii*, Edw. The upper and lower sides of both sexes of the early and late forms are shown, together with the egg and pupa, and a full series of enlarged drawings illustrating the larva in all its stages. This is a Coloradan insect, and flies in the mountains at an elevation of from 5,000 to 8,000 feet. Up to the present there is no recorded instance of *N. Ridingsii* having been taken in Canada.

Plate II. shows *Chionobas Aeno*, Bdl., ♂ and ♀, and a variety of the male, as well as *Ch. Aeno*, var. *Assimilis*, Butler, and the egg of *Crambis*, Freyer. *Aeno* is an arctic species occurring with the variety in Labrador, and also in Colorado where it inhabits the loftiest mountain peaks. An interesting account of its habits is given from the notes of Mr. David Bruce, who has done a great deal to work up the life-histories of the butterflies of the Coloradan mountains. *Aeno* belongs to the *Semidea* group of the genus, and has been confounded with that species and *Crambis*, Freyer. Mr. Edwards says:—"It was not till Mr. Bruce explored the peaks of Colorado that it became possible to understand what *Aeno* was, and the limitation of *Brucei* made clear the position of *Crambis*."

The series is now arranged as follows:—

1. CRAMBIS, Freyer.
2. BRUCEI, Edw.
3. AENO, Bdl.
—— var. ASSIMILIS, Butler.
4. SEMIDEA.
5. SUBHYALINA.

Ch. Also, Bdl., Mr. Edwards rejects altogether as an American species.

Plate III. shows *Ch. Macounii*, the grand species which was discovered at Nepigon, north of Lake Superior, by Prof. John Macoun, of the Geological Survey, in whose honour it was named. *Ch. Macounii* belongs to a different group of the genus to the species mentioned above, and finds its place with *Californica* and some other large species occurring on the Pacific coast. It is a fine insect expanding 2-2½ inches

and has the remarkable feature of lacking the sexual band of androconia or special scales, which is such a striking characteristic of the males of all the other species in the genus. The plate is a very beautiful one, and shows a pale male and the full life-history with the exception of the pupa. The female figured, although of course copied from an actual specimen, is hardly typical of that sex, and it is to be hoped that at some future time Mr. Edwards will publish another illustration showing the more usual form, which has a much richer appearance both on the upper and under sides.

Ch. Macounii is decidedly a variable species, both in the intensity of the golden brown of the wings, in the amount of infuscation along the nervures, and in the size and number of the ocelli. Both sexes frequently have three ocelli on the primaries, and occasionally four. One specimen in my collection, plainly a male, has four distinct ocelli on the primaries, the second and fourth from the apex large and pupilled. In fact, this specimen has more nearly the markings of what appears to me the typical form of the females. There is also a very much infuscated variation of the male which is rarely taken, in which the nervures are all broadly bordered and the greater part of the surface of the disk is covered with dark scales. One of these was mentioned by Mr. Edwards in his original description (CAN. ENT., XVII., p. 74), and was omitted from the plate now published for want of space. The life-history of this species has not yet been fully worked out, as no one has succeeded in obtaining the pupa. It will probably be much like that of *Ch. Chryxus*; but for the present it is unknown, and it remains for some expert and patient breeder to carry the larvæ through all their stages and obtain this missing link. The eggs are easily obtained when a female has been captured; but the breeding is very tedious, the larval life lasting nearly two years.

JAMES FLETCHER.

MONOGRAPH OF THE NORTH AMERICAN PROCTOTRYPIDÆ, by William H. Ashmead. Bulletin of the U. S. National Museum, No. 45; pages 472; plates 18.

Every student of the Hymenoptera must be delighted at the issue of this magnificent volume, which bears most ample testimony to the extensive studies and patient industry of the author. Treating, as he does, of a family in which the American species had previously been but meagrely represented in collections, he has necessarily been compelled to describe

a large proportion of the insects now recognized, and to erect a considerable number of genera for their reception. The labour involved in the critical examinations requisite for the determination and description of so many microscopic forms, and in the preparation of the voluminous text, must have been enormous, yet the author has been able to amplify and embellish his work by the delineation of some one hundred and fifty exquisite figures.

The position of the Proctotrypidæ in the order Hymenoptera is considered to be much more closely allied to some families of the Aculeata than to the Chalcididæ, with which they have been usually grouped, while they also approach in other respects the parasitic Cynipidæ. The Mymarinae, hitherto included as a sub-family, are set aside as constituting a distinct family allied to the Chalcididæ, so that the species now contained in the Proctotrypidæ are characterized, and distinguished from the Chalcids, by the pronotum extending back to the tegulæ, and the ovipositor issuing from the tip of the abdomen. Ten sub-families are recognized, which contain about one hundred and thirty genera, represented by nearly six hundred species—a doubling of the genera and quadrupling of the species as enumerated in the catalogue of Hymenoptera issued a few years ago by Mr. Cresson. Many of the genera are known only by single species, but others contain numerous forms, the most extensive being *Polygnotus* (32), *Proctotrypes* (21), *Prosacantha* (27) and *Telenomus* (32). The synoptic tables requisite for the separation of the species in such genera, as well as the tables for the distinction of genera, etc., give evidence of great care and skill in their preparation and arrangement.

While many of the genera are apparently confined to the more southerly and westerly regions, the species in other groups have an extended range, which at times seems to be almost continental, as for instance *Proctotrypes californicus*, which has been taken at Ottawa. The members of this family have received but scanty attention in Canada, so that their distribution northward cannot be stated, but undoubtedly many interesting species could be found by a careful and patient collector in any locality. Provancher, in his *Faune Entomologique*, was able only to announce the occurrence of *nine* species, and about twice as many are recorded in his *Additions* completed just before his death. Mr. Ashmead, however, has been able to enlarge the list of Canadian species to about ninety. With the exception of three forms from Vancouver Island, the

species are all from a few localities in Eastern Ontario and Quebec, so that the Dominion as a whole has been practically unworked. The three western species are *Mesitius vancouverensis* and *Polymecus vancouverensis*, collected by the Rev. G. W. Taylor, of Victoria (and communicated through the writer to Mr. Ashmead), and *Anteon puncticeps*, taken by Mr. Wickham.

Although the Proctotrypids are all small, and frequently microscopic, they show great variations in structure, and their study thus becomes very interesting. A large proportion of them are egg-parasites, while others prey upon Aphididæ, Cecidomyidæ, etc. In many species (noticeably in the sub-family Bethylinæ) the females differ largely from the males in the shape of the head, antennæ and structure generally. Those of the sub-family Dryininæ have remarkable chelate, or pincer-like claws, on the anterior feet, which are probably for more firmly grasping, during oviposition, the small, active homopterous insects on which the larvæ are parasitic. Many forms are wingless or have very rudimentary wings, but they are, nevertheless, very nimble little atoms, and can leap many times their own length.

As the appearance of Mr. Ashmead's splendid monograph may stimulate some of our members to the collection and study of these insects, it may be stated that a considerable number of the species, such as *Bæus*, etc., may be obtained even in winter by sifting moss as is done for small coleoptera. This habit of hibernating in the moss of swampy localities is another feature (not mentioned by the author) which separates them from the other hymenoptera known to me, with the exception, perhaps, of ants, which are also occasionally obtained in sifting.

W. H. H.

CORRESPONDENCE.

SYNCHLOE LACINIA, ABERR. RUFESCENS.

I had intended to withdraw this name, lest the form to which it refers might be one of those already named as a species; but now that it has been published by Mr. Edwards (Vol. XXV., p. 287), it will be useful to define its precise application. The original specimen was described by me as follows:—Bands ochre strongly suffused with orange above and below; bands on upper side of hind-wings broad, orange, reaching to the row of white spots; outer row of spots on both wings unusually large; band on upper side of fore-wings practically continuous. Size, rather small. Juarez (not Juarey), Mexico, Aug. 26.

T. D. A. COCKERELL,

Las Cruces, New Mexico, Nov. 13th, 1893.

Mailed January 15th.

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